

What is claimed is:

- 1) An improved GUP/boric acid formulation that has greater than 95 percent purity.
- 2) An improved GUP/boric acid formulation that has less than one percent of the salt of dicyandiamide and phosphoric acid.
- 3) An improved solid GUP/boric acid formulation that has an even dispersion of GUP and boric acid.
- 4) An improved solid GUP/boric acid formulation that has a solubility of at least 70% in water.
- 5) The composition of claim 1 wherein the amount of unreacted starting materials and unwanted by-products from the GUP reaction process are less than 2 wt.% of the theoretical GUP yield.
- 6) The composition of claim 1 wherein the amount of unreacted starting materials and unwanted by-products from the GUP reaction process are less than 1 wt.% of the theoretical GUP yield.
- 7) The composition of claim 1, wherein the composition does not exhibit an equivalence point at a pKa of about 3.2.
- 8) The composition of claim 1, in the substantial absence of a dicyandiamide/phosphoric acid salt.
- 9) The composition of claim 1 in the form of a solid, wherein the GUP and boric acid are substantially evenly dispersed throughout the composition.
- 10) The composition of claim 1 in the form of solid particulates, wherein the GUP and boric acid are substantially evenly dispersed throughout the composition.
- 11) The composition of claim 1 in the form of solid flowable particulates.

- 12) The composition of claim 1 in the form of solid spherical particulates.
- 13) The composition of claim 1 in the form of solid particulates having a substantially narrow size distribution.
- 14) The composition of claim 1 in the form of solid particulates having an average diameter of less than 50 microns.
- 15) The composition of claim 1 in the form of solid particulates substantially in the absence of fines.
- 16) The composition of claim 3 in the form of a solid fire retardant composition.
- 17) A fire retardant composition in the form of solid flowable particulates.
- 18) The fire retardant composition of claim 17 in the form of solid spherical particulates.
- 19) The fire retardant composition of claim 17 in the form of solid particulates having a substantially narrow size distribution.
- 20) The fire retardant composition of claim 17 in the form of solid particulates having an average diameter of less than 50 microns.
- 21) The composition of claim 17, wherein the fire retardant is selected from a GUP and boric acid composition, ammonium phosphates, ammonium polyphosphates, guanidine phosphate, melamine phosphate, phosphoric acid, dicyandiamide, ammonium sulfate, borax (sodium tetraborate), disodium octaborate, urea, and formaldehyde.
- 22) The composition of claim 2 that does not exhibit an equivalence point at a pKa of about 3.2.
- 23) The composition of claim 4 in the form of a liquid that comprises greater than 70 wt.% solids.

- 24) A method of producing GUP/boric acid fire retardants comprising reacting dicyandiamide and phosphoric acid under conditions that yield linear reaction kinetics.
- 25) The method of claim 24 comprising dissolving in water, substantially simultaneously, dicyandiamide, phosphoric acid, and boric acid, and reacting at least a portion of the dicyandiamide and the phosphoric acid to form guanylurea phosphate.
- 26) The method of claim 24 performed under conditions that inhibit the evolution of heat from the reaction.
- 27) The method of claim 24 comprising:
 - a) providing an aqueous bath,
 - b) adding phosphoric acid to the bath,
 - c) adding dicyandiamide to the bath,
 - d) adding boric acid to the bath, and
 - e) heating the bath, or allowing it to heat, to a temperature that does not yield a substantial exotherm,
 - f) wherein: steps (a)-(d) are performed simultaneously, consecutively, or in any order.
- 28) A method of producing GUP/boric acid solids comprising dewatering an aqueous solution that comprises GUP and boric acid.
- 29) The method of claim 28 wherein the dewatering is effected via spray drying.
- 30) A method of treating cellulosic materials for fire retardance comprising contacting the cellulosic material with the fire retardant composition of claim 1.
- 31) The composition of claim 1 further comprising a cellulosic material.
- 32) The composition of claim 31 in the form of a composite wood product.

33) The composition of claim 31 in the form of composite wood furnish.